Organized Surface Functional Groups: Cooperative Catalysis Via Thiol/Sulfonic Acid Pairing

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Supporting Information

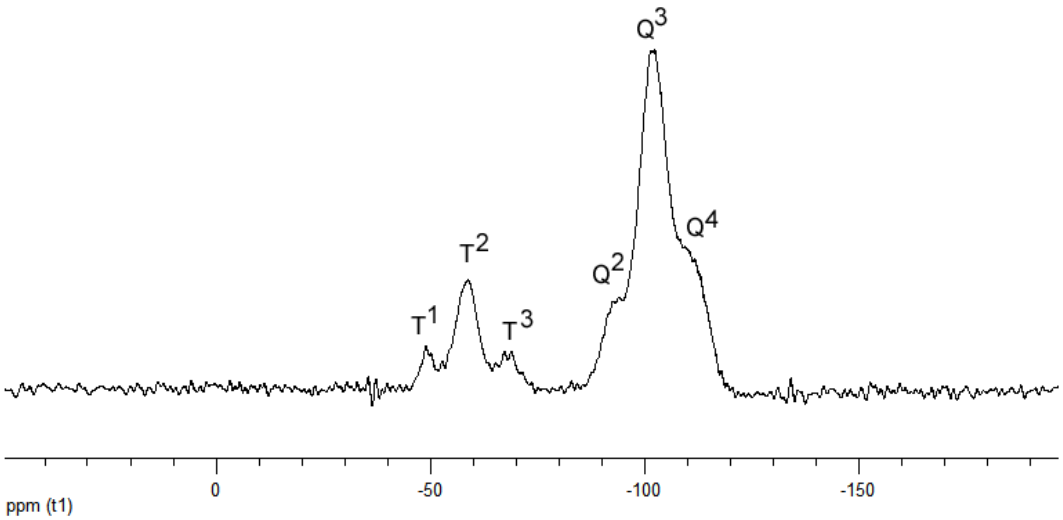

Figure S1. ^{29}Si CP/MAS NMR spectrum of **SBA-g1** (loading = 0.7 mmol/g)

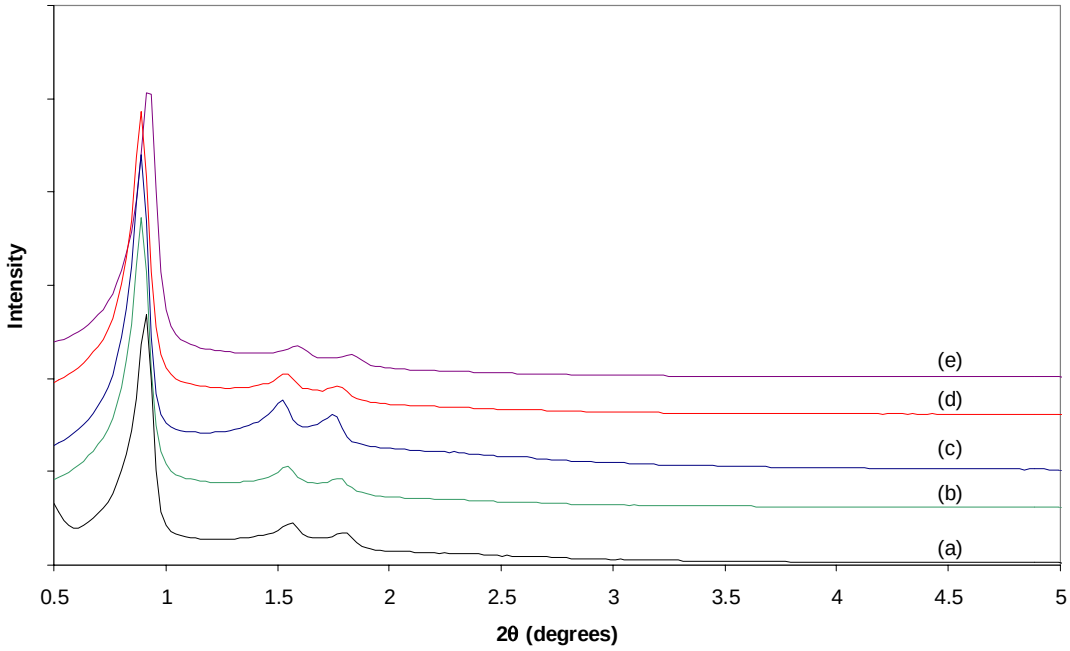

Figure S2. X-Ray Diffraction Patterns of functionalized SBA-15 materials. (a) **SBA-15** (b) **SBA-g1** (c) **SBA-A** (d) **SBA-AT-p** (e) **SBA-AT-s5**

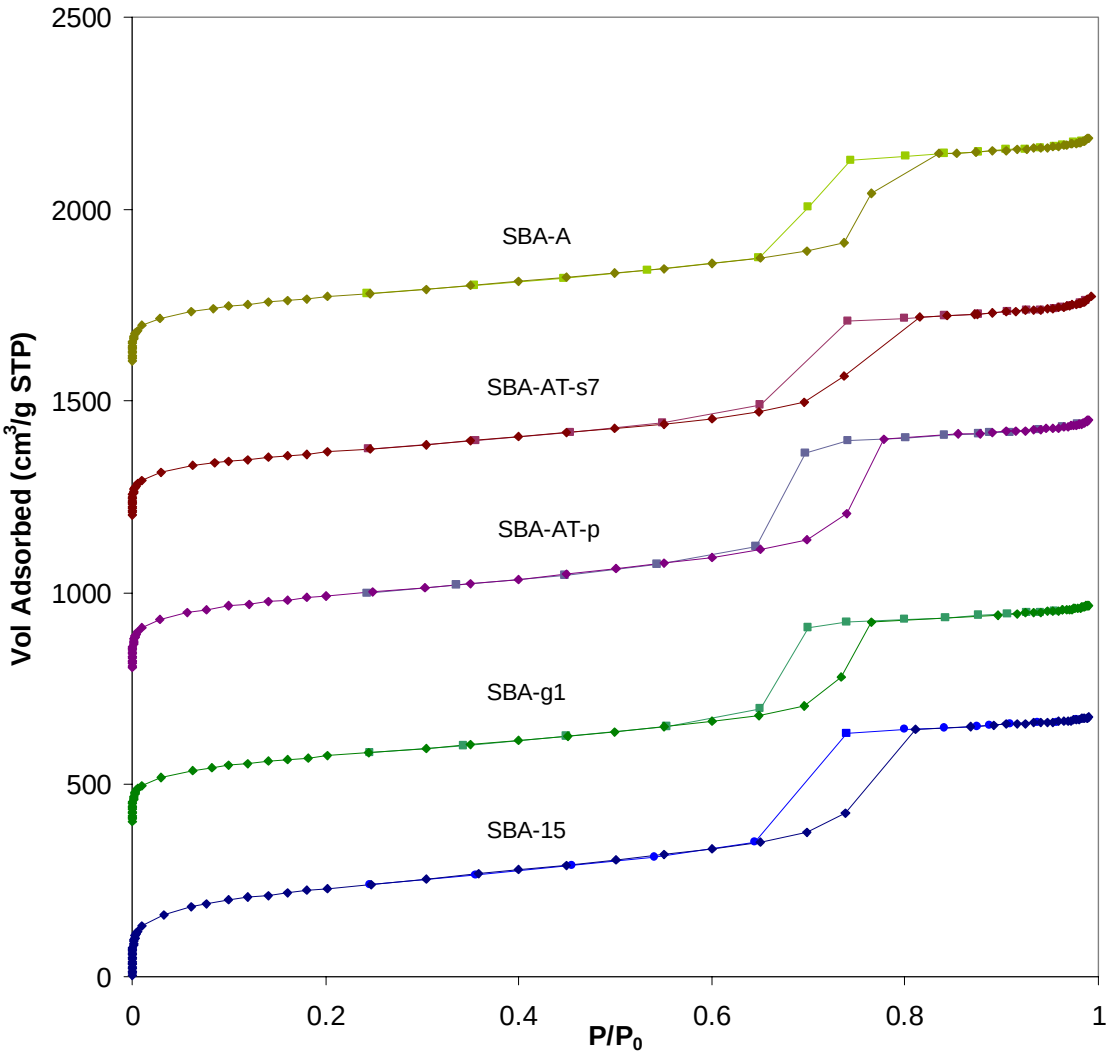

Figure S3. Nitrogen adsorption/desorption isotherms for various SBA-15 materials. Diamonds correspond to adsorption, squares to desorption. Data have been offset vertically by 400 units for clarity. The organic loading of each functionalized material is ~ 0.2 mmol/g.

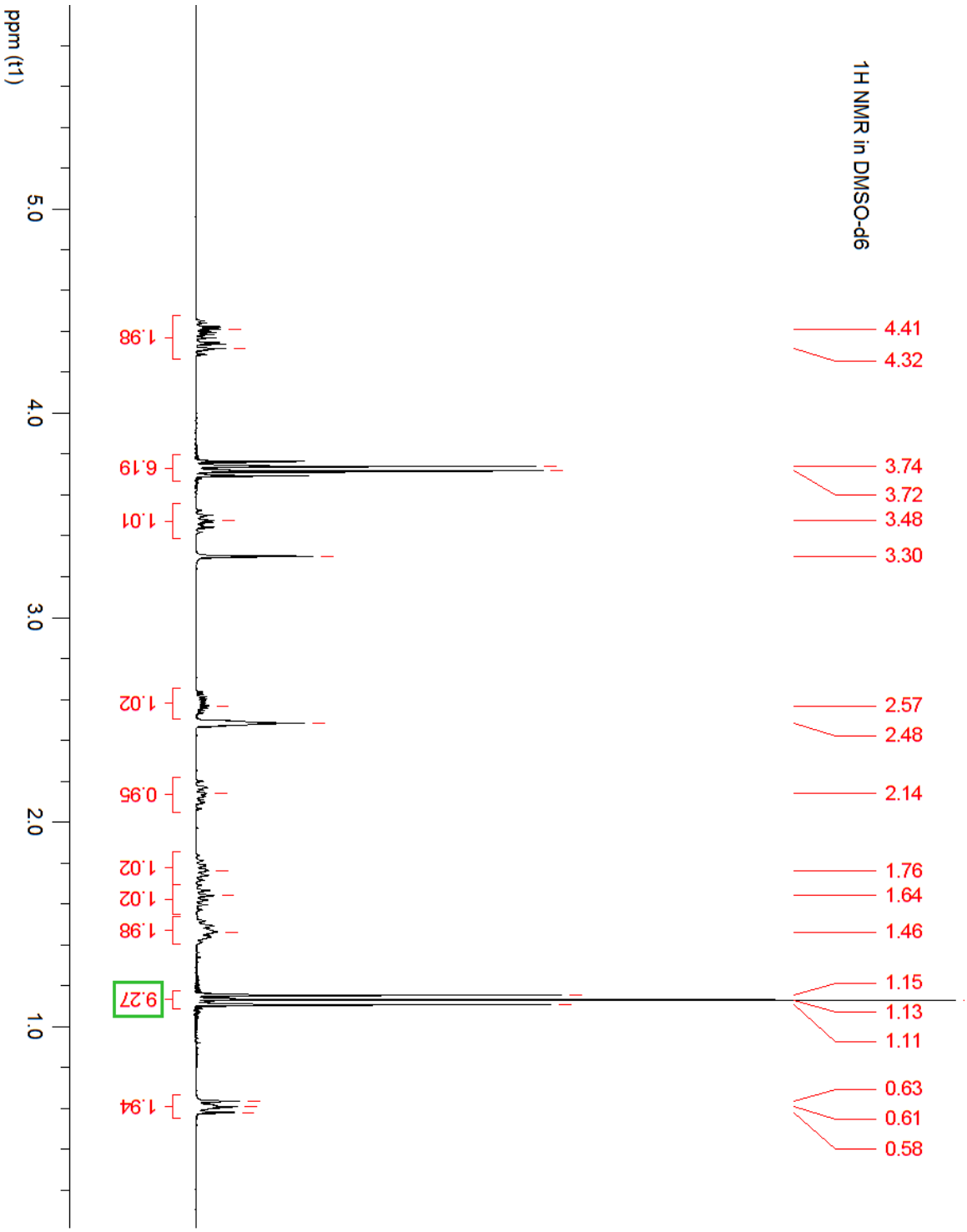

Figure S4. ^{1}H NMR spectrum of silane **1**. Peaks at 3.30 and 2.48 ppm correspond to H_2O and DMSO respectively.

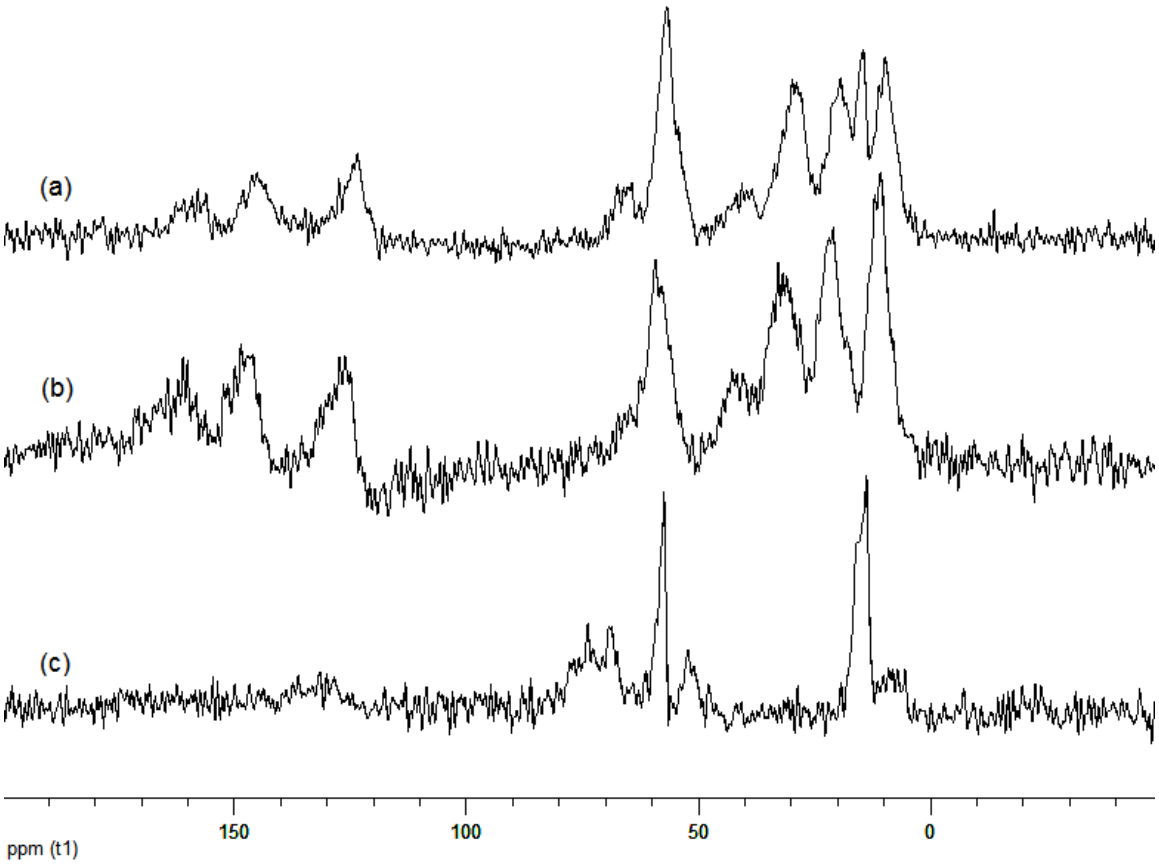

Figure S5. ^{13}C CP/MAS NMR spectra of randomly grafted materials. (a) SBA-15 grafted with silanes **1** and **2** (b) after hydrolysis (c) after disulfide reduction (**SBA-AT-r**)

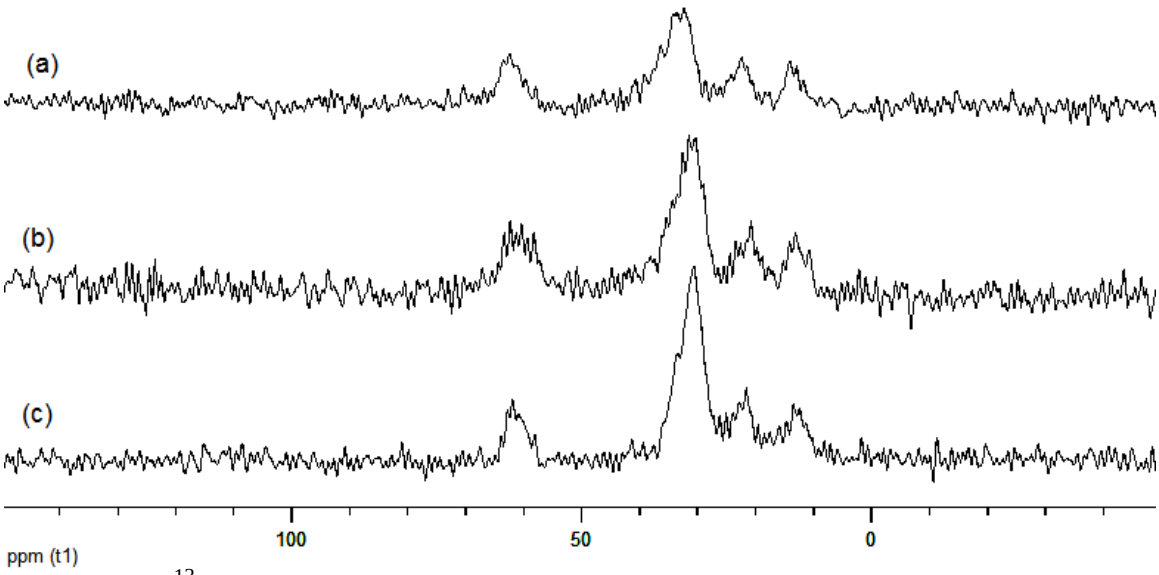

Figure S6. ^{13}C CP/MAS NMR spectra of alkyl spacer materials. (a) **SBA-AT-s1** (b) **SBA-AT-s2** (c) **SBA-AT-s3**

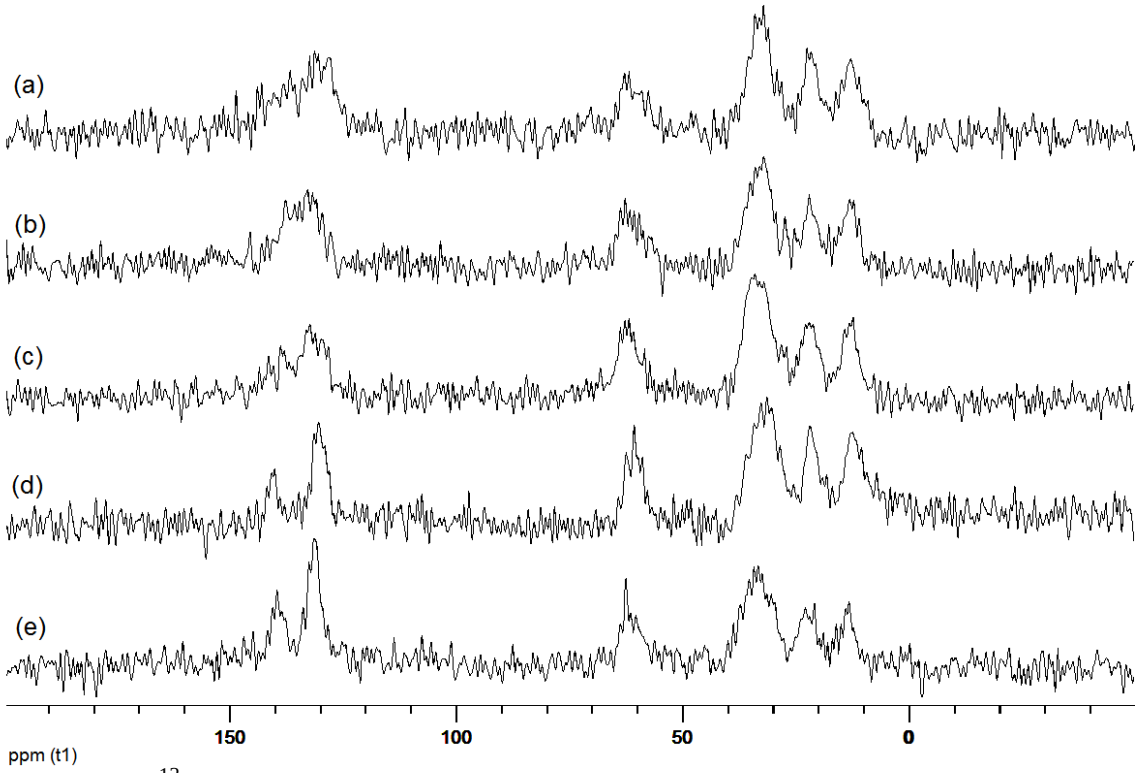

Figure S7. ^{13}C CP/MAS NMR spectra of aryl spacer materials. (a) **SBA-AT-s4** (b) **SBA-AT-s5** (c) **SBA-AT-s6** (d) **SBA-AT-s7** (e) **SBA-AT-s8**